



By-Product Synergy

Sustainable Development Through Action

Andy Mangan - US Business Council for Sustainable
Development

Dennis Milligan - The Dow Chemical Company,
Environmental Technology Center

Today's Dow

- World's largest chemical company
- Annual sales of \$30 billion
- 171 manufacturing sites in 35 countries
- About 50,000 people

Delivering on the Promise of Chemistry



We will use technology to help lead society forward. We will conceive, design, engineer and execute solutions that remove barriers to human potential and productivity.

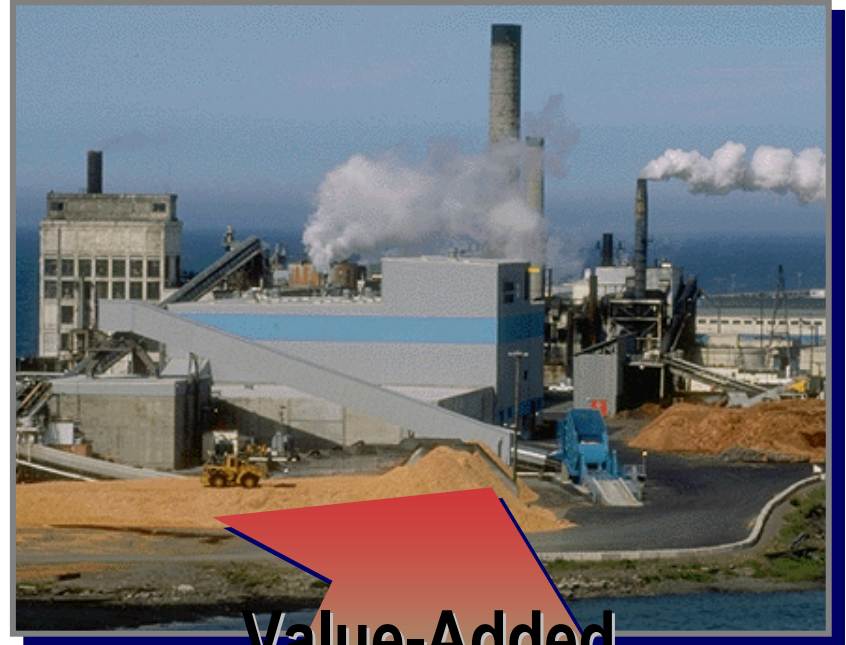
BPS Concept Evolution

- What if we were witnessing business opportunity and not just cost reduction?
- What if we began to speak in terms of 100% product instead of zero waste?
- What if every gram of raw material became product?
- What if our so-called “wastes” weren’t wastes at all, but were by-products or raw materials for other industries?

Molten Steel



Impurities = Slag



**Value-Added
to Cement**



Synergy results in Patented CemStar® Process

BENEFITS

- 5-15 % production increase
- 10 % CO₂ reductions
- 25-45% NO_x reductions
- \$8/ton slag into \$70/ton cement
- 2 EPA climate change awards



Tampico pilot study proves viability of BPS model



- 20 companies
- 68 synergies found
- 29 commercially possible
- 13 pursued by group

Tampico Implementation: 13 synergies pursued

1. Mine tailings

2. PVC residuals

3. Acetonitrile

4. Ferric chloride

5. Hydrochloric acid

6. Butadiene

7. Chemical drums
and barrels

8. CO₂ recovery

9. Polymer residuals

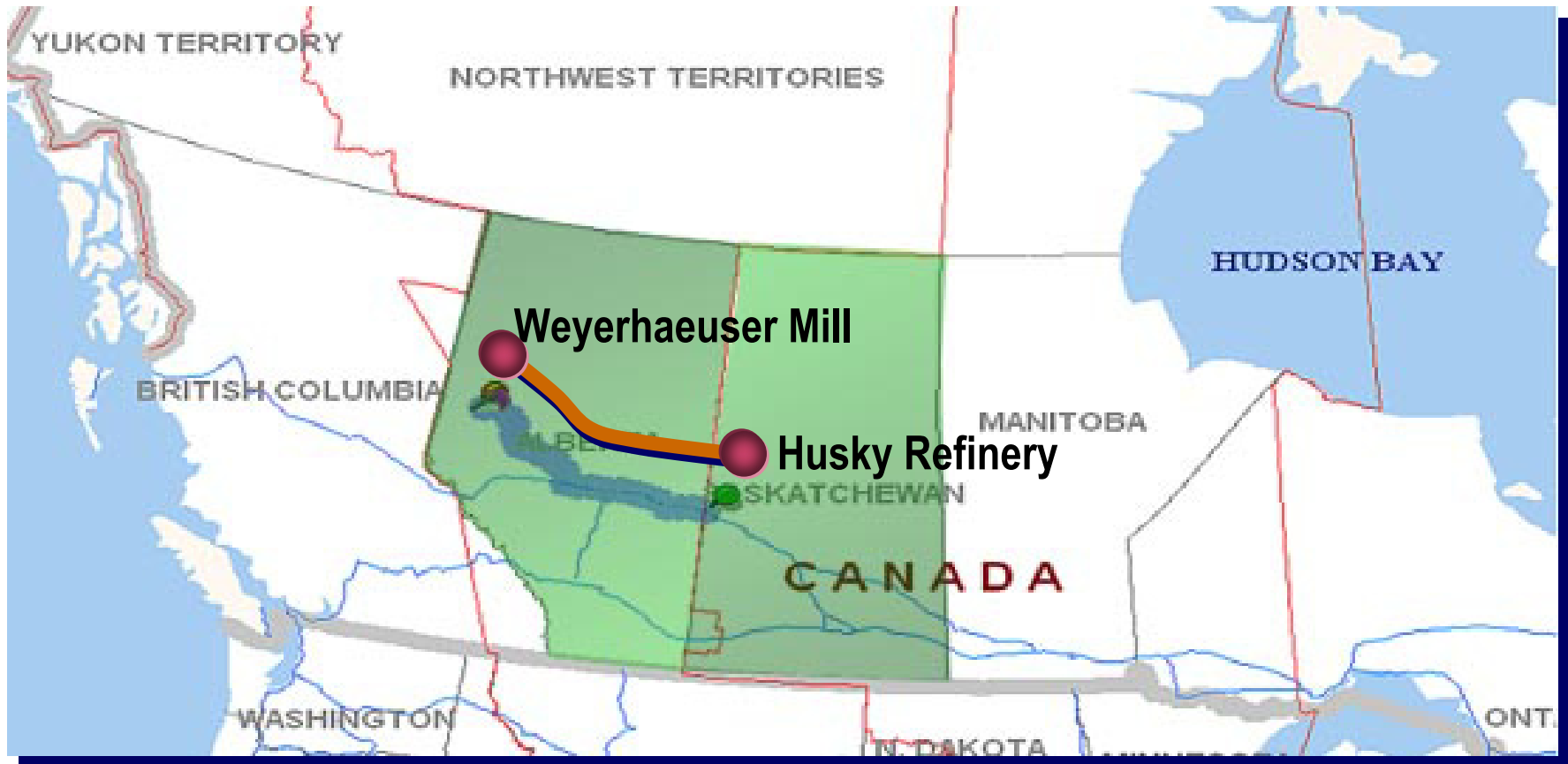
10. Polymer
rehabilitation

11. Polyethylene/
polypropylene

12. Fiberglass

13. Gasification

Spent Caustic Synergy



Launched Projects

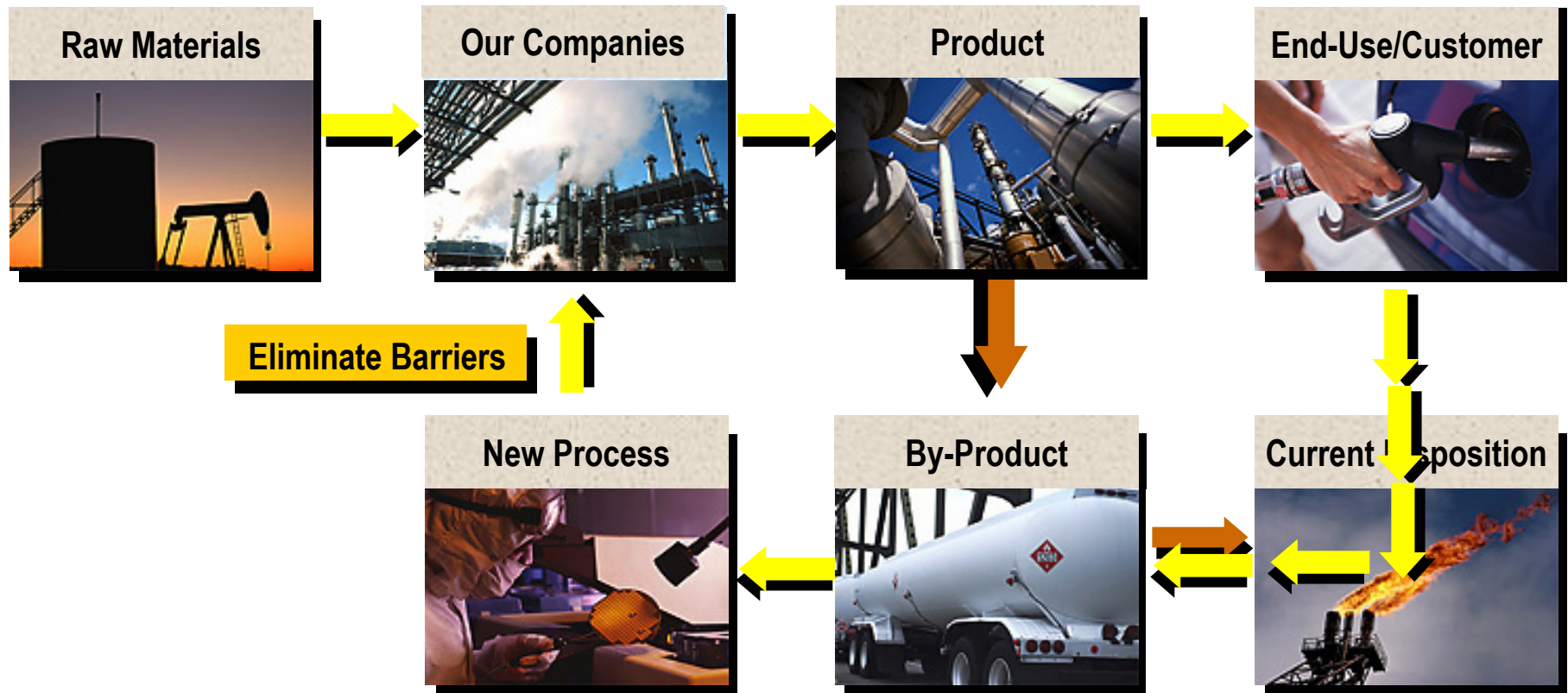


NJ project represents the next evolution of By Product Synergy

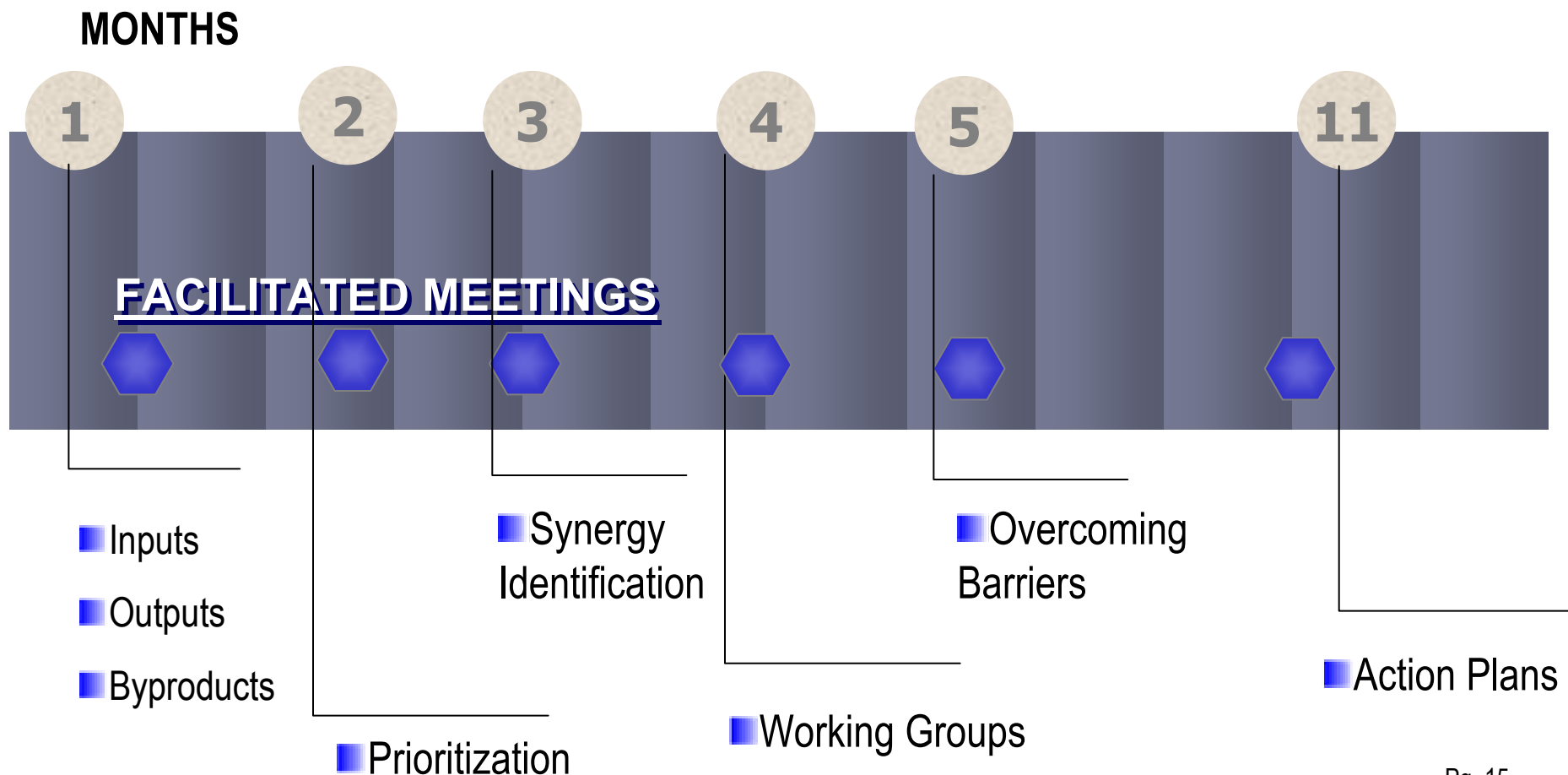
- PSEG Power
- Mannington Mills
- Merck
- Dow
- Iversand
- NJ American Water
- Burlington County Resource Recovery Complex
- Motiva Refining
- Winsinger Company
- Hercules
- Greentree
- Ferro Corporation*
- US Pipe*
- US Block*
- Picatinny Army Arsenal*
- Lakehurst Naval Air Station*

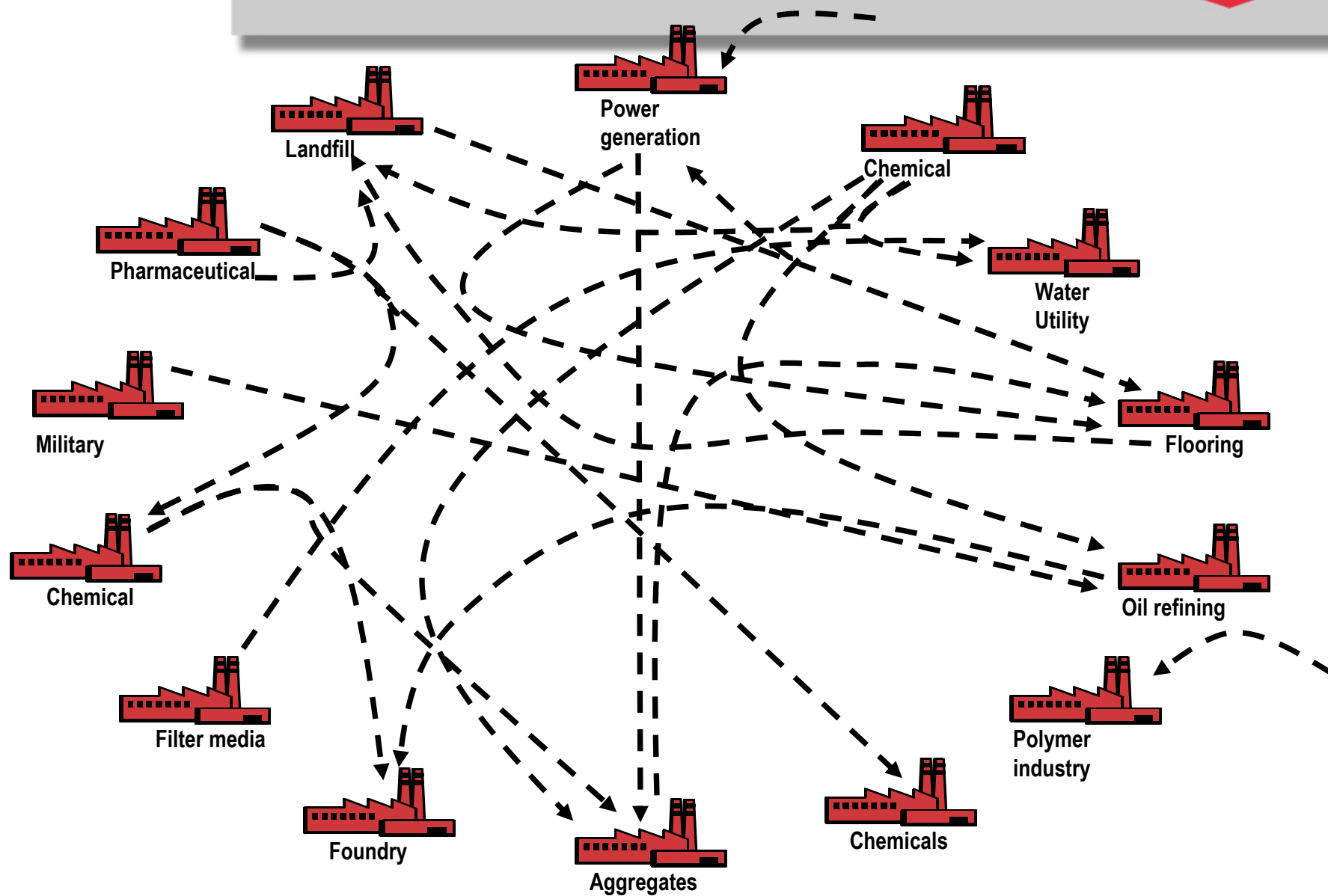
EPA Cooperative Agreement to evaluate environmental benefits and examine regulatory barriers

- Office of Policy, Economics and Innovation
- Office of Solid Waste and Emergency Response
- Office of Air and Radiation
- Regions 2 & 3
- NJDEP, DNREC, PADEP



BPS combines intensive data collection, facilitated working meetings, and on-line communication to identify successful synergies





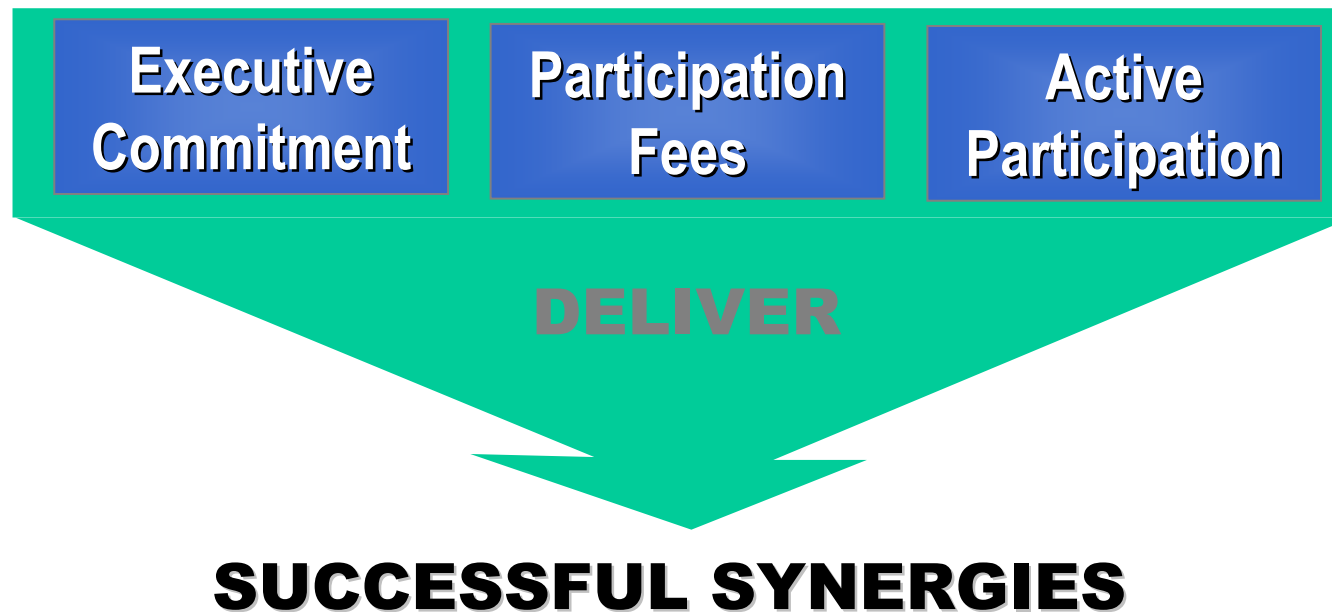
Phase I BPS Project

- Freeport Site - Dow's largest integrated site with 75 production units.
- St. Charles Site - 20 production units.
- Texas City Site - 10 production units.

Phase 2 BPS Project

- 10-20 non-Dow collaborators
- Local, state & federal government
- Community, Academic organizations

We're launching a project: Please become a part of the success story





Living.
Improved daily.